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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE **RECEIVED**

Application of: Pramod K. Srivastava

MAY 10 2001

Serial No.: 09/750,972

Group Art Unit: 1645

Filed: December 28, 2000

Examiner: To Be Assigned

For: ALPHA (2) MACROGLOBULIN AS A HEAT SHOCK PROTEIN RECEPTOR AND USES THEREOF Attorney Docket No.: 8449-134

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**INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §1.56 AND §1.97**

Assistant Commissioner for Patents  
Washington, D.C. 20231

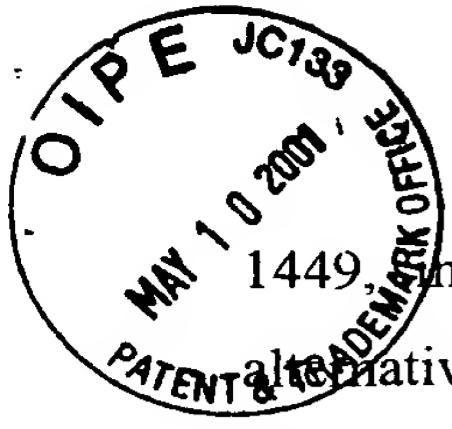
~  
Sir:

In accordance with the duty of disclosure imposed by 37 C.F.R. § 1.56 to inform the U.S. Patent and Trademark Office of all references coming to the attention of each individual associated with the filing and prosecution of the subject application which are or may be material to the patentability of any claim of the application, Attorneys for Applicants respectfully direct the Examiner's attention to the references AA-DJ listed on the attached revised form PTO 1449. Copies of references AA-DJ are submitted herewith.

The above identified application is a continuation-in-part of copending application No. 09/668,724, filed September 22, 2000, which is a continuation-in-part of co-pending application No. 09/625,137, filed July 25, 2000, claiming priority under 35 U.S.C. § 119(e) to provisional application no. 60/209,095, filed June 2, 2000.

While not to be construed as indicating that the Examiner should not review and consider fully all the listed references, Applicant particularly direct the Examiner's attention to references AD, AF, AP, AR, AV, AW, AX, AY, BR, CA, CJ, CK, CM, CU, and CW.

Identification of the listed references is not to be construed as an admission of Applicant or Attorneys for Applicant that such references are available as "prior art" against the subject application. Consequently, Applicant respectfully declines to use form PTO-



1449, since this form identifies all of the references cited therein as "Prior Art." As an alternative, Applicant submits herewith a "revised form PTO 1449" entitled "List of References Cited by Applicant" instead of "List of Prior Art Cited."

Applicant requests that the Examiner review all the references identified on the attached revised PTO Form 1449, and that they be made of record in the file history of the above-identified application.

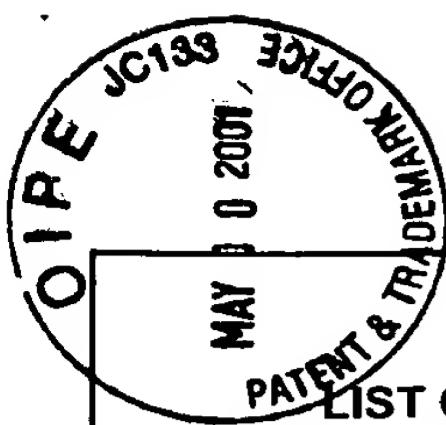
Pursuant to 37 C.F.R. § 1.97(b), since it is believed that this information disclosure statement is being filed before the mailing date of a first Office Action on the merits, no fee is due in connection herewith. However, should the Patent Office determine otherwise, please charge the required fee to Pennie & Edmonds LLP deposit account no. 16-1150; a duplicate of this sheet is enclosed.

Respectfully submitted,

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Adriane M. Antler (Reg. No.)

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Sheet 1 of 4

<b>LIST OF REFERENCES CITED BY APPLICANT</b> <i>(Use several sheets if necessary)</i>	ATTY. DOCKET NO.	APPLICATION NO.
	8449-134	09/750,972
	APPLICANT	
	Srivastava, Pramod K.	
FILING DATE		GROUP
12/28/00		1645

**U.S. PATENT DOCUMENTS**

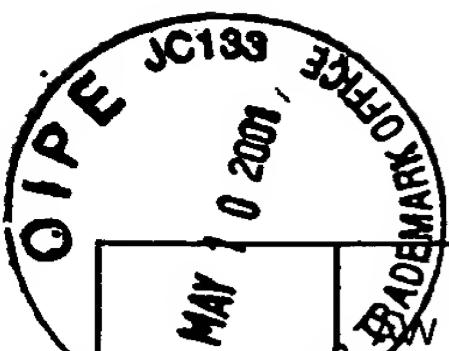
*EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	AA	09/411,075					10/4/99
	AB	5,112,298	5/12/92	Prince et al.			
	AC	5,554,293	9/10/96	Uhoch			
	AD	5,637,082	6/10/97	Pages et al.			
	AE	5,837,251	11/17/98	P. Srivastava			
	AF	5,846,928	12/8/98	Kishida			
	AG	5,935,576	8/10/99	P. Srivastava			
	AH	5,961,979	10.5.99	P. Srivastava			
	AI	5,985,270	11/16/99	P. Srivastava			
	AJ	6,017,540	1/25/00	P. Srivastava			
	AK	6,027,731	2/22/00	Pauza			
	AL	6,033,561	3/7/00	Schoendorfer			
	DH	09/668,724					9/22/00
	DI	09/625,137					7/25/00
	DJ	60/209,095					6/2/00

**FOREIGN PATENT DOCUMENTS**

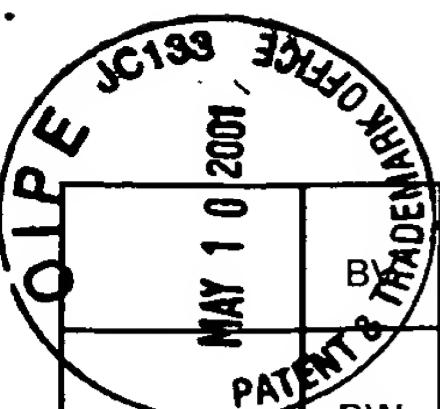
		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	AM	WO 96/10411	4/11/96	PCT				
	AN	WO 97/10002	3/20/97	PCT				
	AO	WO 98/46743	10/22/98	PCT				

**OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)**

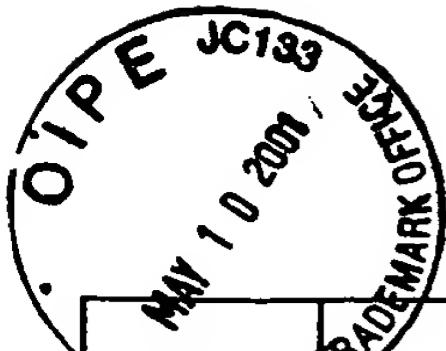
AP	Arnold-Schild et al., 1999, "Cutting edge: receptor-mediated endocytosis of heat shock proteins by professional antigen-presenting cells", <i>J. Immunol.</i> 162: 3757-3760.
AQ	Arnold et al., 1995, "Cross-priming of minor histocompatibility antigen-specific cytotoxic T cells upon immunization with the heat shock protein gp96", <i>J Exp Med.</i> Sep 1;182(3):885-9.
AR	Asea et al., 2000, "HSP70 stimulates cytokine production through a CD14 dependant pathway, demonstrating its dual role as a chaperone and cytokine", <i>Nature Med.</i> 6: 435-42
AS	Bevan, 1995, "Antigen presentation to cytotoxic T lymphocytes in vivo", <i>J. Exp. Med.</i> 192: 639-41
AT	Binder et al., 1998, <i>Cell Stress &amp; Chaperones</i> 3 (Supp.1): 2.
AU	Bosch et al., 1999, "State of the art of therapeutic apheresis in Europe", <i>Ther Apher.</i> 3(3):197-8.
AV	Castellino et al., 2000, "Receptor-mediated Uptake of Antigen/Heat Shock Protein Complexes Results in Major Histocompatibility Complex Class I Antigen Presentation via Two Distinct Processing Pathways", <i>J. Exp. Med.</i> 191: 1957-64.



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	AX	Chu et al., 1994, "Adjuvant-Free in Vivo Targeting. Antigen Delivery by $\alpha_2$ -macroglobulin enhances antibody formation", <i>J. Immun.</i> 152(4):1538-45.
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	AZ	Ciupitu et al., 1998, "Immunization with a lymphocytic choriomeningitis virus peptide mixed with heat shock protein 70 results in protective antiviral immunity and specific cytotoxic T lymphocytes", <i>J Exp Med.</i> 187(5):685-91.
	BA	Coutinho et al., 1998, "Alpha-2-macroglobulin receptor is differently expressed in peritoneal macrophages from C3H and C57/B16 mice and up-regulated during <i>Trypanosoma cruzi</i> infection", <i>Tissue and Cell</i> 30: 407-15
	BB	Day et al., 1997, "Direct delivery of exogenous MHC class I molecule-binding oligopeptides to the endoplasmic reticulum of viable cells", <i>Proc Natl Acad Sci. USA</i> 94: 8064-8069
	BC	Dennis et al., 1989, "Alpha 2-macroglobulin is a binding protein for basic fibroblast growth factor", <i>J Biol Chem.</i> 264 (13):7210-6.
	BD	Fadok et al., 2000, "A receptor for phosphatidylserine-specific clearance of apoptotic cells", <i>Nature</i> 405(6782):85-90.
	BE	Fay et al., 1979, "Leukopheresis Therapy of Leukemic Reticuloendotheliosis (Hairy Cell Leukemia)", <i>Blood</i> 54: 747-749
	BF	Forrester et al., 1983, "Effect of modified alpha 2macroglobulin on leucocyte locomotion and chemotaxis", <i>Immunology</i> . 50(2):251-9.
	BG	Haas et al., 1988, "cDNA cloning of the immunoglobulin heavy chain binding protein", <i>Proc Natl Acad Sci U S A.</i> 85(7):2250-4.
	BH	Herz et al., 1988, "Surface location and high affinity for calcium of a 500-kd liver membrane protein closely related to the LDL-receptor suggest a physiological role as lipoprotein receptor", <i>EMBO J.</i> 7(13):4119-27.
	BI	Hickey et al., 1989, "Sequence and regulation of a gene encoding a human 89-kilodalton heat shock protein", <i>Mol Cell Biol.</i> 9(6):2615-26.
	BJ	Hickey et al., 1986, "Sequence and organization of genes encoding the human 27 kDa heat shock protein", <i>Nucleic Acids Res.</i> 14(10):4127-45.
	BK	Hilliker et al., 1992, "Assignment of the gene coding for the alpha 2-macroglobulin receptor to mouse chromosome 15 and to human chromosome 12q13-q14 by isotopic and nonisotopic in situ hybridization", <i>Genomics</i> . 13(2):472-4.
	BL	Holtet et al., 1994, "Recombinant $\alpha_2$ M Receptor binding domain binds to the $\alpha_2$ M receptor with high affinity", <i>Ann N Y Acad Sci</i> . 737:480-2.
	BM	Huang et al., 1999, "NMR solution structure of complement-like repeat CR8 from the low density lipoprotein receptor -related protein", <i>J. of Biolog. Chem.</i> 274: 14130-14136
	BN	Huang et al., 1984, "Specific covalent binding of platelet-derived growth factor to human plasma alpha 2-macroglobulin. Proc Natl Acad Sci U S A. 81(2):342-6.
	BO	Hunt et al., 1990, "Characterization and sequence of a mouse hsp70 gene and its expression in mouse cell lines", <i>Gene</i> . 87(2):199-204.
	BP	Jensen et al., 1989, "Comparison of $\alpha$ -macroglobulin receptors from human, baboon, rat and mouse liver", <i>Biochem. Arch.</i> 5:171-6
	BQ	Jindal et al., 1989, "Primary structure of a human mitochondrial protein homologous to the bacterial and plant chaperonins and to the 65-kilodalton mycobacterial antigen. <i>Mol Cell Biol.</i> 9(5):2279-83.
	BR	Kol et al., 2000, "Cutting edge: heat shock protein (HSP)60 activates the innate immune response: CD14 is an essential receptor for HSP60 activation of mononuclear cells", <i>J Immunol.</i> 164(1):13-17
	BS	Kornfeld et al., 1980, "Plasmapheresis in Myasthenia Gravis", <i>Plasma Therapy</i> , 2(3): 127-133
	BT	Krieger and Herz, 1994, "Structures and functions of multiligand lipoprotein receptors: macrophage scavenger receptors and LDL receptor-related protein (LRP)", <i>Annu Rev Biochem.</i> 63:601-37.
	BU	Kristensen et al., 1990, "Evidence that the newly cloned low-density-lipoprotein receptor related protein (LRP) is the alpha 2-macroglobulin receptor", <i>FEBS Lett.</i> 276(1-2):151-5.



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	BY	Maki et al., 1993, "Mapping of the genes for human endoplasmic reticular heat shock protein gp96/grp9", Somat Cell Mol Genet. 19(1):73-81.
	BX	McKee and Collins, 1974, "Intravascular Leukocyte thrombi and aggregates as a cause of morbidity and mortality in leukemia", Medicine 53: 463-478
	BY	Millward and Hoeltge, 1982, "The Historical Development of Automated Hemapheresis", J. of Clin. Apheresis 1: 25-32
	BZ	Misra et al., 1993, "Receptor-recognized alpha 2-macroglobulin-methylamine elevates intracellular calcium, inositol phosphates and cyclic AMP in murine peritoneal macrophages". Biochem J. 290 ( Pt 3):885-91.
	CA	Mitsuda et al., 1993, "A receptor-mediated antigen delivery and incorporation system", Biochem. and Biophys. Res. Comm. 191: 1326-31
	CB	Mitsuda et al., 1993, "A receptor mediated delivery of an HIV 1 derived peptide vaccine", Biochem Biophys Res Commun 194(3): 1155-60
	CC	Moestrup et al., 1993, "α <sub>2</sub> -macroglobulin-proteinase complexes, plasminogen activator inhibitor type-1-plasminogen activator complexes, and receptor-associated protein bind to a region of the α <sub>2</sub> -macroglobulin receptor containing a cluster of eight complement type repeats", J. of Biolog. Chem. 268: 13691-13696.
	CD	Moestrup et al., 1992, "Distribution of the alpha 2-macroglobulin receptor/low density lipoprotein receptor-related protein in human tissues", Cell Tissue Res. 269(3):375-82.
	CE	Nicchitta et al., 1998, "Biochemical, cell biological and immunological issues surrounding the endoplasmic reticulum chaperone GRP94/gp96", Curr Opin Immunol. 10(1):103-9.
	CF	Nielsen et al., 1996, "Identification of residues in alpha-macroglobulins important for binding to the alpha2-macroglobulin receptor/Low density lipoprotein receptor-related protein", J Biol Chem. 271(22):12909-12.
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	CH	O'Connor-McCourt et al., 1987, "Latent transforming growth factor-beta in serum. A specific complex with alpha 2-macroglobulin", J Biol Chem. 262(29):14090-9.
	CI	Orth et al., 1992, "Complexes of tissue-type plasminogen activator and its serpin inhibitor plasminogen-activator inhibitor type 1 are internalized by means of the low density lipoprotein receptor-related protein/alpha 2-macroglobulin receptor", Proc Natl Acad Sci U S A. 89(16):7422-6.
	CJ	Osada et al., 1987, "Murine T cell proleferation can be specifically augmented by macrophages fed with specific antigen: α-2-macroglobulin conjugate", Biochem. and Biophys. Res. Comm. 146: 26-31
	CK	Osada et al., 1988, "Antibodies against viral proteins can be produced effectively in response to the increased uptake of alpha 2 macroglobulin: viral protein conjugate by macrophages", Biochem and Biophys. Res. Comm. 150: 883-889.
	CL	Pineda et al., 1994, "Applications of therapeutic apheresis", Mayo Clin Proc. 1994 Sep;69(9):893-4.
	CM	Report of the AMA Panel on Therapeutic Plasmapheresis, Current Status of Therapeutic Plasmapheresis and Related Techniques.
	CN	Sargent et al., 1989, "Human major histocompatibility complex contains genes for the major heat shock protein HSP70", Proc Natl Acad Sci U S A. 86(6):1968-72.
	CO	Savill et al., 1992, "Thrombospondin cooperates with CD36 and the vitronectin receptor in macrophage recognition of neutrophils undergoing apoptosis", J Clin Invest. 90(4):1513-22.
	CP	Singh-Jasjua et al., 2000, "Cross Presentation of Glycoprotein 96-associated antigens on major histocompatibility complex class molecules requires receptor-mediated endocytosis", J. Exp. Med. 191:1965-74
	CQ	Soeiro et al., 2000, "Trypanosoma cruzi: Acute Infection Affects Expression of α-2-macroglobulin and A2MR/LRP Receptor Differently in C3H and C57BL/6 Mice", Exper. Parasitology 96: 97-107
	CR	Spero et al., 1980, "Plasma Exchange in Preparation of Mild Factor IX Deficient Hemophiliacs for Surgical Procedures", 19-22
	CS	Srivastava et al., 1991, "Stress-induced proteins in immune response to cancer", Curr Top Microbiol Immunol. 167:109-23.



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	CU	Srivastava PK, 1993, "Peptide-binding heat shock proteins in the endoplasmic reticulum: role in immune response to cancer and in antigen presentation", Adv Cancer Res. 1993;62:153-77.
	CV	Srivastava PK, 1994, "Heat shock proteins in immune response to cancer: the Fourth Paradigm", Experientia. (11-12):1054-60.
	CW	Srivastava et al., 1994, "Heat shock proteins transfer peptides during antigen processing and CTL priming", Immunogenetics. 39(2):93-8. Review.
	CX	Srivastava et al., 1998, "Heat shock proteins come of age: primitive functions acquire new roles in an adaptive world", Immunity. 8(6):657-65.
	CY	Strickland et al., 1990, "Sequence identity between the alpha 2-macroglobulin receptor and low density lipoprotein receptor-related protein suggests that this molecule is a multifunctional receptor", J Biol Chem. 15;265(29):17401-4.
	CZ	Suto and Srivastava, 1995, "A mechanism for the specific immunogenicity of heat shock protein-chaperoned peptides", Science 269(5230):1585-8
	DA	Ting et al., 1988, "Human gene encoding the 78,000-dalton glucose-regulated protein and its pseudogene: structure, conservation, and regulation", DNA. 7(4):275-86.
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	DC	Van Leuven et al., 1993, "Molecular cloning and sequencing of the murine alpha-2-macroglobulin receptor cDNA", Biochim Biophys Acta. 1173(1):71-4.
	DD	Wassenberg et al., 1999, "Receptor mediated and fluid phase pathways for internalization of the ER Hsp90 chaperone GRP94 in murine macrophages", J. Cell Science 112: 2167-2175.
	DE	Weiner et al., 1980, "Plasmapheresis in multiple sclerosis: preliminary study", Neurology 30: 1029-33.
	DF	Willnow et al., 1994, "Molecular dissection of ligand binding sites on the low density lipoprotein receptor-related protein", J. of Biolog. Chem. 269: 15827-15832
	DG	Yamazaki et al., 1989, "Nucleotide sequence of a full-length cDNA for 90 kDa heat-shock protein from human peripheral blood lymphocytes", Nucleic Acids Res. 17(17):7108.

EXAMINER

DATE CONSIDERED

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.